Sub-Laboratory Hypothyroidism, Low Body Temperature and the Empirical Use of T3

2 hours CME/ CE
Third hour is non CME/ 1 CE
2018 Burlington Vermont

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Financial Disclosure: Co-owner Restorative Formulations
Problem

- Patients not on thyroid medicine, have low thyroid symptoms, TSH and other blood tests are normal
- Patients are on thyroid medicine, TSH test is normal, still not feeling well

Solution

- Temperature & TSH = Simplicity & Success

Purpose of T3 is to set the speed of DNA transcription, the speed of life

- Corepressor (CoR) is displaced
- Coactivator (CoA) is recruited
- DNA transcription is accelerated

• Metabolic rate is proportional to temperature in all life forms (mammals, birds, reptiles, amphibians, fish, plants, bacteria) [mass-, temp-adjusted universal metabolic rate]
• Metabolic rate is proportional to temperature in cold-blooded or warm- blooded animals (whether the temperature sets the metabolic rate or the metabolic regulation sets the temperature).
• “Universal Temperature Dependence” of biological processes. Temp tracks metabolic rate in all life.
• When body temperature goes up metabolic rate goes up, when temperature goes down metabolic rate goes down, independent of any form of regulation or any other factors.

Body temperature and metabolic rate track each other

Mouse’s core body temperature (blue line), oxygen consumption (pink line)


Thyroid hormone blood tests don’t measure thyroid hormone expression because they don’t measure body temperature.
80% of T3 is produced and regulated intracellularly in a time-specific and tissue-specific fashion.

This regulation and control is invisible to blood tests.

A great deal of the T3 stimulation of the nucleus depends on the intracellular conversion of T4 to T3, and that’s regulated.

Ubiquitin Proteasome Pathway

Key regulatory system for protein levels

Ubiquitin is found in every cell

E1 activates ubiquitin for attachment to E2

E2 transports ubiquitin to E3 for attachment to targeted protein

Process repeats until chain of at least 4 ubiquitin

Targeted and tagged protein is recognized and digested by proteosome and amino acids are recycled

This is the key pathway that regulates the activity of D2 which converts T4 to T3
• T4 and rT3 both accelerate the destruction of type II deiodinase (D2), decreasing the half-life of D2 by as much as 50%, slowing the conversion of T4 to T3
• This can explain why many patients don’t feel well on T4-containing medicine
• Some people feel better on herbs than on T4

• With good T4 to T3 conversion, T4 medicine may improve a patient’s temperature (expression).
• With poor T4 to T3 conversion, T4 medicine and RT3 may make conversion worse.
• I don’t recommend T4-containing medicine until a patient’s temperature is normal
• T4 to T3 conversion are reduced with stress fasting and illness.
• Heavy metals and other toxins also disrupt thyroid function

Bianco AC, Nunes MT, et al. The Role of Glucocorticoids in the Stress-Induced Reduction of Extrathyroidal 3,5,3'-Triiodothyronine Generation in Rats. Endocrinology. 1987; 120(3):1033
Schimmel M. Thyroidal and Peripheral Production of Thyroid Hormones. Annals of Internal Medicine 1977;87:760-768
Typical lifestyle stressors

- Childbirth
- Divorce
- Death of a loved one
- Job or family stress
- Surgery or Accidents
- Heavy metal toxicity (e.g., mercury)
- Bromine, Fluorine, Chlorine; especially a mixture of compounds that contain these
T3 can be a more effective antidepressant than antidepressants

- Hypothyroidism is known to cause depression. What if thyroid tests normal?
- Only 1/3 of patients achieve remission on antidepressants.
- T3 can correct up to 50% of treatment-resistant depression.
- T3 can often correct bipolar symptoms after failing on an average of 14 different medicines.
- Optimal thyroid function beyond simply being within the normal values, may be necessary for optimal response.


Disorders such as ... hypothyroidism must be excluded before a diagnosis of PMS can be considered.
Hypothyroidism and hyperthyroidism in anxiety disorders revisited: new data and literature review

Naomi M. Simon, Deborah Blacker, Nicole B. Korbly, Saumya G. Sharma, John E. Mann, Mark H. Pollack

Research report

Anxiety Disorders Program, Mass General Hospital, Boston, MA, USA

Accepted 13 November 2001

Thyroid function should be checked in patients with Panic Disorder and Generalized Anxiety Disorder
Hypothyroidism is also associated with:

- Migraine headache
- Carpal tunnel syndrome
- Depression
- Hair loss
- Irritable bowel syndrome
- Fibromyalgia
- Obesity
- Mental fog
- Low sex drive


Workup for low thyroid symptoms and low body temperature

- History and physical exam. Lifestyle, nutrition, exercise, stress, depression, heavy metal or toxin exposures.
- Comprehensive metabolic panel > rule out kidney disease, diabetes, liver problems, etc.
- Complete blood counts > rule out anemia, infection, leukemia, and so on.
- TSH > rule out primary hypothyroidism
- Consider ferritin (preferably above 70 ng/L, TPO is heme dependent)
- Consider food allergy testing (inflammation can inhibit thyroid expression)
- Consider adrenal fatigue
- EKG, good baseline to have
- If no better explanation for the symptoms and temperature, impaired transport/conversion/resistance of thyroid hormones may also be considered.

Yu J, Koenig RJ. Regulation of hepatocyte thyroxine 5’-deiodinase by T3 and nuclear receptor coactivators as a model of the sick euthyroid syndrome. J Biol Chem. 2000 Dec 8;245(49):38293-301
Evaluating Thyroid Function:

History and physical provide context for TSH. (e.g., dry skin, swelling, slower reflexes, slower heart rate, lower body temperature)

1. **TSH** - TSH is considered the most important and sensitive test for hypothyroidism. Typically elevated when thyroid hormone supply is low, but can still be low in secondary or tertiary hypothyroidism. TSH can vary by time of day (40%), by race, by age, by other factors.

2. **Body temperature** - Likewise, temperature may still be low even when TSH is normal since it depends on thyroid hormone expression.

Garber, JR; Cobin, RH; Gharib, et al. Clinical Practice Guidelines for Hypothyroidism in Adults. Thyroid. 2012 December; 22(12):1200–1235
Evaluating Thyroid Patients:

1st, consider thyroid hormone supply

Is the person euthyroid or hypothyroid?

- **If on thyroid medicine, what was their TSH before starting thyroid medicine?** Patients who have been taking thyroid medicine for years may never have been hypothyroid, or may no longer be.

- **Supply problems can be permanent (thyroidectomy, hypothyroidism) or temporary (hypothyroidism)**

- **What is TSH now?** T4 and RT3 can down regulate the deiodinase enzyme. Patient might not need T4 for supply and it might be impairing conversion.
Evaluating Thyroid Patients:

Next, consider thyroid hormone conversion

- If TSH is normal and Temperature is low then patient may have a conversion (peripheral) problem.
- Body Temperature appears to be the parameter that correlates best with symptoms
People don’t have hypothyroid symptoms without having a low body temperature.
Typical Symptoms

- Fatigue
- Fibromyalgia
- Depression
- Weight gain
- Migraines
- PMS
- Irritability
- Fluid retention
- Hair loss
- Dry skin, Dry hair
- Insomnia

- Anxiety and Panic attacks
- Irritable bowel syndrome
- Asthma and Allergies
- Irregular periods
- Decreased memory
- Decreased concentration
- Muscle and joint aches
- Low sex drive
- Carpal tunnel syndrome
- Hives
• 9 obese patients and 12 lean controls in Italy. Morning temperature is the same. One degree F split during day.
• The temperature does fluctuate during the day.
How to measure body temperature

• By mouth, with a Galinstan (liquid metal consisting of gallium, indium, and tin) thermometer.
• 3 times a day, 3 hours apart, starting 3 hours after waking
• For several days for diagnosis (temperature runs higher between ovulation and menstruation).
• You can also encourage your patients to check their temperatures when they feel their best and when they feel their worst, so they can see the correlation.
• Symptoms can occur T<98.6F and more often with T<98F

Incidence of low body temperatures

- NHANES (National Health and Nutrition Examination Survey) listed incidence of hypothyroidism as .3% and subclinical hypothyroidism as 4.5%.
- Low temperatures with normal TSH is on the order of 10 times more common (more than 30% of population).
- Some people being treated with T4 for hypothyroidism that have normal TSH, still report symptoms and low temperatures

Garber, JR; Cobin, RH; Gharib, et al. Clinical Practice Guidelines for Hypothyroidism in Adults. Thyroid. 2012 December; 22(12):1200–1235
If TSH is high and temperature is low

I suggest and we’ll discuss supporting thyroid gland function:

- Thyroid support herbs and nutrients (e.g. iodine)
- Immune support herbs if Hashimoto’s Thyroiditis
- Thyroid hormone replacement as needed
- May recover or may need thyroid hormone replacement for life.
If TSH is normal and temperature is low

I find:

- Usually **reversible** for both euthyroid and hypothyroid patients.
- Healthy lifestyle measures
- Use thyroid and adrenal support herbs, nutrients (selenium)
- More severe cases will need T3 therapy (relatively simple way to make an huge difference in the lives of your patients)
- Some people will need T3, botanicals, and nutrients to normalize their temperatures
- T3 therapy may be beneficial even when T3 blood tests are high and RT3 tests are low
Iodine Controversy in Hashimoto’s Thyroiditis

• It’s hard to tell someone can’t swim until you add water

• It’s hard to tell someone has insufficient selenium and reduction potential until you add iodine

• Increasing iodine in a selenium deficient population can increase cell damage and TPO.

• Good to supplement Se if supplementing iodine

• Iodine can be useful to all cells (as the antioxidant iodolactone), but is certainly important in the breasts, prostate. NIS is found in eyes, gastric mucosa, cervix, salivary glands as well.
Oxidative stress > less reduced glutathione > more H₂O₂ in cell > more oxidized iodine in cell > more damage > more autoimmunity

GSH = Reduced glutathione, GS-SG = Oxidized glutathione, GPX = Glutathione peroxidase, TPO = Thyroid peroxidase
Selenium increases GPX which reduces $\text{H}_2\text{O}_2$ inside follicular cell, increasing GSH

- Iodine increases thyroid autoimmunity in specially bred mice, however, iodine plus selenium reduces it.

- Selenium increased plasma glutathione peroxidase by 21% and TPO antibody decreased by 76%. When Se stopped, glutathione peroxidase dropped and TPO markedly climbed.

The more glutathione in reduced state (GSH) the lower the TPOab, TSH


*Enhanced oxidative stress in Hashimoto's thyroiditis: interrelationships to biomarkers of thyroid function.*

Rostami R¹, Aghasi MR, Mohammadi A, Nourooz-Zadeh J.
Above 1mg/d, iodolactone made from arachidonic acid

- 6-iodolactone (6-IL) is a key regulator of apoptosis and cellular proliferation in the thyroid. It inhibits Epidermal Growth Factor (EGF) from thyroid follicles. Studies on 6-iodolactone are usually done with dosage ranges over 6 mg of iodine/day

- 6-IL inhibits the proliferation incited by EGF, as well as glucose transport

- Other iodolipids such as iodoheptadecanal have been shown to suppress thyroid function in at least 4 other ways providing thyroid auto regulation

- Similar iodinated lipids form in the breast via Lactoperoxidase (LPO)

- Inflammation > cysts > nodules > hyperplasia > cancer in various tissues (thyroid, breast, prostate)
6-iodolactone, key mediator of antitumoral properties of iodine.

Nava-Villalba M¹, Aceves C².
6 ways iodolipids affect the thyroid

Above 1 mg/d iodide ceases to function as a substrate for hormonogenesis. It’s a homeostatic signal that prevents thyrotoxicosis (à la Wolff-Chaikoff)

1. inhibition of H2O2 generation by dual oxidases, thereby blocking iodide oxidation and organification

2. suppression of sodium-iodide symporter (NIS) expression, stopping the entry of iodide and lowering the intracellular iodide concentration;

3. inhibition of thyroid hormone secretion.

   **In high concentrations of iodide, additional mechanisms are also observed, like**

4. reduction of thyroid blood flow, (12mg/day)

5. inhibition of thyroid growth,

6. induction of apoptosis. Difference between necrosis and apoptosis can be seen and (fragmentation of DNA and other findings in apoptosis)
• This 6-IL is 6-iodolactone (not interleukin 6 which is much larger).
• Necrosis (sicker) and Apoptosis (healthier) are very different
• 6-IL key mediator of antitumoral properties of I-. [thyroid, breast cancer]

Suppresses EGF. Does 6-IL help tight junctions in gut?

Fig. 3. Generation and intracellular actions of 6-IL in extrathyroid cells. Molecular iodine supplement is incorporated into the membrane cell by facility dif!
Impact of iodine deficiency on thyroid system

• Hypothyroidism
• Hyperplasia / Nodules
• Thyroid Cancer
• Hashimoto’s Thyroiditis

“…there is little doubt that increasing dietary iodine intake will limit goiter and thyroid nodule formation, the formation of differentiated thyroid cancer, and possible further dedifferentiation to anaplastic thyroid carcinoma.”


Iodine and anaplastic thyroid carcinoma.

Smyth PP.
TPO levels with herbal and nutrient support

- Small percentage of people can have TPO go up with iodine supplementation.
- On the other hand, up to 70% of people can normalize their temperatures with the combination of iodine + selenium + herbs (thyroid, adaptogens). 95% of the time TPO antibodies go down, not up
TSH levels with iodine supplementation

- TSH can sometimes go up significantly, just by adding iodine.

- If TSH goes up and temperature goes up and patient feels better then not hypothyroidism. T3, and T4 usually in normal range.

- If patient remains on the iodine, TSH usually normalizes in 6–12 months, but sometimes longer.

- If patient weans off iodine, tests TSH usually normalizes in several weeks.

- In a few: rash, palp’s, potentiation of thyroid meds.

* http://www.inchem.org/documents/jecfa/jecmono/v024je11.htm
Iodine testing

24-hour urine testing:

• (Avoid iodine supplements, kelp, fish, and sea vegetables for 5 days prior to and during collection) First morning urine is discarded

• 50 mg loading dose of iodine (greater excretion of loading dose suggests greater repletion)

• Collect 24 hour urine

• > 45mg excretion (90%) = sufficiency (measured by ICP-MS)

I suggest Therapeutic trial:

• 6 mg / day of KI for 3 days helps rule out hidden toxic nodule (increased heart rate and palpitations). Rarely, rash. Iodine is not an allergen.

• Trial is handy for supplementation lasting 2-3 months

DoctorsData.com; Urine Halides Iodine Pre & Post
We tested 3 iodine products made from KI and I₂ (tablet, capsule, liquid)

- Ion chromatography
- Inductively coupled plasma spectrometry
- X-ray fluorescence
- Triiodide analysis

- We found that all the iodine present in tablet and capsule was in the iodide form, even if manufactured with I₂. Either I₂ changed to I⁻ during the manufacturing process, or it changed once dissolved

- Lugol’s solution does contain I₂

Halogens and halogenated compounds displace iodine and vice versa

- Bromine
- Chlorine
- Fluorine
- Perchlorate
- PBDEs (have estrogenic activity)

We are increasingly exposed to these toxins which can have an enormous impact on our health through their impact on iodine.

Happily, iodine greatly aids displacement and detoxification
Lifestyle measures for low body temperature

I suggest:
- Stress-reduction, declutter, simplify
- Regular, moderate exercise, especially short sprints
- Detoxification, sauna
- Organic foods (to avoid pesticides and toxins)
- Avoid gluten, aspartame, excess alcohol
- Get adequate rest, good multi-vitamin and nutrition
- Iodine (12 - 48 mg/d) + Selenium (100 - 800 mcg / d)
- Zinc (12 - 48 mg/d)
- Vitamin D balances humoral and cellular immune function
- Iron
- B12 (1 mg/d) important in digestion, blood cell formation, other
- Tyrosine
- Certain thyroid (dose according to body temperature) and adrenal support
  botanicals
- Improved gut health > consider resting the gut
- Fat loss to reduce inflammation
- Eating organically
Botanical Support

• There are roughly 3000 different molecules in every herb. They are not random molecules.
• Animal life depends on plant life. It follows that animal health can depend on plant health and selection.
• I find, about 70% of people are able to get their temperatures to normal using herbs and nutrients alone (usually within 4w).
• Herbs and nutrients may be dosed according to body temperature since herbs support the thyroid, thyroid supports metabolic rate, metabolic rate is proportional to temperature.
• If the temperature doesn’t normalize then the treatment is not improving the metabolic rate.
• Dosing of herbs and nutrients can be changed once/week according to body temperature.
Guggul (Commiphora Myrrha)

- Contains ketosteroids that support iodine uptake and T4 to T3 conversion.
- Supports healthy cholesterol levels. Decreases total serum lipids, cholesterol, triglycerides, and beta lipoproteins and increases all thyroid functions.

Bladderwrack (Fucus Vesiculosis, Kelp)

- Good source of iodine and other substrates.
- Contains diiodotyrosine (2 DIT join to make T4).
- Non-iodine compounds in seaweed may also be very helpful in thyroid related disorders such as Hashimoto’s thyroiditis.
- Used for centuries in Asian cultures for both hypo and hyper.

Blue Flag (Iris Versicolor)

- Used extensively from 1830–1940 to treat thyroid disorders
- Late 1800’s made into a pharmaceutical called Iridin for hypothyroidism
- Commercially used to detoxify toxic land
- Traditionally used to “move sluggish body fluids”

Triphala Fruit (Amla, Bellerin myrobalan, Chebulic myrobalan)

- Used for centuries as anti-inflammatory and other
- Thyroid most susceptible to inflammation
Botanical Adrenal Support

- Very important in thyroid disorders and treatment
- Help normalize endocrine function, resistance to stress
- Support for stamina as well as mental and immune function
- Thyroid and Adrenal go together like two players on the same team. When one struggles the other is taxed as well
- Adrenal support can often help people tolerate T3 therapy
Adrenal Support Herbs

• Siberian Ginseng (Eleutherococcus senticocus) – helps optimize adrenal response. Excellent for stress-related exhaustion and emotional disturbances.

• Ashwagandha (Withania somnifera)

• Holy Basil (Ocimum sanctum) – helps to normalize hyperglycemia, corticosterones, and adrenal hypertrophy from chronic stress. GABAergic, calming

• Rose Root (Rhodiola rosea) – adaptogen and anti-stress herb. Increases serotonin and endorphins, mood

• Licorice – Glycyrrhizic acid decreases the breakdown of cortisol which can bind to mineralocorticoid receptors and increase blood pressure. Also been used in the treatment of hepatitis, and viral illnesses such as EBV
Immune Support Herbs

• Rehmannia – Helps balance immune function and B and T cell biosynthesis.
• Cordyceps – Fungus, antioxidant, immune-modulating, protects liver.
• Rosemary (Rosmarinic acid) – Rosmarinic acid is a polyphenol that helps balance immune function by inducing apoptosis of activated T cells and neutrophils without affecting T cells or neutrophils in their resting state. May be helpful in T-cell leukemia, RA, Lupus, SLE, Ulcerative Colitis, Crohn’s, MS. Neuroprotective.
• Turmeric – Neuroprotective and neuroregenerative, anti-inflammatory, anti-oxidant, promotes healthy vasculature.
Downsides of using T4 when TSH is normal and body temperature is low

• Symptoms tend to recur when the T4 is discontinued
• People can feel worse on T4 since T4 and RT3 down regulate T4 to T3 conversion and can competitively inhibit T3.
• Classic story: Better for 2–3 months, then worse again, or worse “right off the bat”
• Desiccated has T4 and instant-release T3
Effect on T4, RT3, and T3 levels

Clearing the imbalance by clearing the pathways

Start

Add Desiccated vs. Add T3

Reducing T4 and RT3 potentially up regulates deiodinase
Supraphysiological Cyclic Dosing of Sustained Release T3 in Order to Reset Low Basal Body Temperature.

MICHAEL FRIEDMAN, ND*; JORGE R. MIRANDA-MASSARI, PHARMD†;
MICHAEL J. GONZALEZ, DSC, PhD, FACN‡

The use of sustained release tri-iodothyronine (SR-T3) in clinical practice, has gained popularity in the complementary and alternative medical community in the treatment of chronic fatigue with presentation.

Based exclusively on the protocol involving

11 patients underwent WT3 protocol for CFS. All patients increased their body temperatures. All patients improved in the 5 symptoms measured. Recovery time varied from 3 weeks to 12 months.
## Table 2. CFS Symptom Score with WTS Protocol

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<th>Headaches</th>
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Temperatures normalized

Symptoms much improved

See Means
• How many have seen temperatures normalized with herbs and nutrients alone? Results?

• How many have seen temperatures normalized with T3 alone? Results?
Object of cyclic T3 with sustained release agent in euthyroid patients

- eliminate symptoms of slow metabolism
- by resetting the oral body temperature to 98.6°F
- by replacing some or all of the T4 in the body with T3 (clearing T4 and RT3 from the pathways may up-regulate the deiodinase enzyme, restoring normal conversion)
Cycling patients on and off T3 for one or more cycles is often necessary to normalize the body temperature (upregulation? reverses T3 resistance?)
Essential concepts for T3 therapy

- Mainly, T4 provides a steady supply of T3 as it is slowly converted to T3 by the body. T4 may not have any thyroid hormone activity itself, but may occupy the TR. The half-life of T4 is 3 times longer than T3.
- Thus, T4 has a very stabilizing influence on the thyroid hormone system.
When T4 levels go down and T3 levels go up with treatment,
the stabilizing effect of the T4 is replaced with
the stronger and more unsteady effect of the T3.

Hopefully, the temperature will go up but we need to
minimize unsteadiness (most common reason for fluid
retention, palpitations, shakiness)
One way to minimize the unsteady effect of T3 is to **make the most** of the stabilizing effect of the endogenous T4 by increasing the T3 doses quickly (every 24 hours, and sometimes every 12 hours because “Fast compensators” often do better going up quickly (otherwise, temps may be lower on the day after starting T3, rather than higher). Compensation time).

That way, patients are able to get the stronger effect of the T3 while the stabilizing effect of the T4 is still present but decreasing.
Compounded sustained-release T3 maximizes steadiness. Use a reliable compounding pharmacist (some patients report better results changing pharmacists)

Traditional T3

T3 Compound

The higher the dose of T3, the more unstable the effect it has on the thyroid hormone receptors.
One benefit of weaning a cycle of T3 is that it allows the thyroid system to steady down again.

It is important for people to steady down between cycles.

Otherwise, people might start the next cycle unsteady and stay unsteady for the whole cycle.

That is why it is usually best for patients to wean off the T3 entirely between cycles.
Weaning off the T3 slowly (decreasing the dose every 2–6 days) gives the thyroid system and pathways more of a chance to come back on line and maintain any progress in temperature and symptoms that has been obtained from the cycle of T3.
Thus, to keep T3 levels as steady as possible patients should:

- use well-made sustained-release T3 designed to be taken every 12 hours
- take the T3 every 12 hours on time, not even 3 minutes late
- counter-intuitively, increase the T3 doses quickly, wean off the T3 doses more slowly.
- make sure they are off the T3 long enough between cycles for their systems to steady down.
Simplified T3 protocol  
(quick and easy version based on pulse)

- Will help about 80% of patients.
- Email me now at dwilson.wts@gmail.com for T3 tutorial videos and patient handout for Simplified T3 Protocol (based on pulse rate)
- Original protocol based on body temperature
Getting started

• Temps are usually 97.8F or lower when patients check their temperatures every 3 hours, 3 times a day, starting 3 hours after waking, for a couple of days.
• Anything less than 98.6 F can explain symptoms.

FIGURE 1. Twenty-hour body core temperature profiles (±SEM) in obese (n = 9; 2 females) and lean subjects (n = 12; 2 females). Grey panel represents the dark period. The values of BcT recorded every 2 min are averaged every 15 min.
Evaluate whether the patient can tolerate T3

- Can you run around the block, and do you feel OK when your pulse rate goes up? Usually, yes.
- Ever had any cardiac problems (e.g., MI within the past 2 months) or blood pressure issues? PVC’s, palpitations, skipped beats? People with pre-existing cardiac symptoms are most likely to have cardiac symptoms from T3 therapy.
- Adrenal insufficiency and low magnesium levels can interfere with a person tolerating T3 therapy well
Adrenal support for T3 therapy

- **Adrenal support herbs** (Eleutherococcus, Holy Basil, Rhodiola, Licorice) for a couple of weeks before treatment and/or **hydrocortisone 5 mg BID** (8 am and noon).
- Some doctors do not like to give T3 without supporting the adrenals first.
Hypertension can be normalized before T3 therapy

African Snake Root, Motherwort, Hawthorne berry, Jamaican Dogwood, Mistletoe.

Cycling up on the T3

- Have them program their timers or phones with alarms that are 12 hours apart.
- Start on 7.5 mcg / dose every 12 hours
Cycling up on the T3

Increase dose by 7.5 mcg/dose/day

- Day 1 > 7.5 mcg (am), 7.5 mcg (pm)
- Day 2 > 15 mcg, 15 mcg
- Day 3 > 22.5 mcg, 22.5 mcg
- Day 4 > 30 mcg, 30 mcg
- ...
- Day 10 > 75 mcg, 75 mcg
- no higher on this cycle, just to be cautious
Patient instructions

- Take the T3, and take it exactly on time, with or without food. Timing of each dose can affect steadiness for up to 2 weeks.
- If a few hours late with a dose, go ahead and take the dose and keep following the directions.
- Write down your pulse every day.
- Stop increasing T3 and call the doctor if:
  - Pulse is above 100 b.p.m., or
  - Feeling palpitations.
To manage side effects:

- Lily of the Valley (contains cardiac glycosides as in Digitalis), Night blooming Cereus (no glycosides), Hawthorne, Motherwort.
- Starts working within one hour to calm tachycardia
- **T4 test dose**: T3 toxicity or unsteadiness? Check temp, 12.5 mcg T4 and assess after 45 mins. Can repeat the dose of T4 an hour later if needed. Given PRN but sometimes that means daily


Choi DH1, Kang DG, Cui X. The positive inotropic effect of the aqueous extract of Convallaria keiskei in beating rabbit atria. Life Sci. 2006 Aug 15;79(12):1178-85
Continuing the protocol:

- If no issues, keep going up on the T3 (notice that this is irrespective of body temperature)...you cannot really overdo the temperature.
- Once on 75 mcg BID...stay there for about 3 days and then cycle down every 2–3 days (or slower).
- Thus, the first cycle is only up to 75 mcg BID and lasts about a month.
- Ask the patient to check their body temperatures about 2–3 times/day for a couple of days to see if and how it has changed; and then return for a visit.
At 1-month visit

- How did you feel?
- Any palpitations?
- If temperature not fully normalized (which is typical) and no complaints then can cycle up to 90 mcg BID on next cycle (if no rapid pulse or palpitations).
- Then they can cycle back down slowly (no faster than one decrement every 2 days, or slower) and check their temperatures.
- Can continue more cycles as needed.
Many options, Plateaus are possible

- If they find a dose that they feel really good on and their temperatures are in the 98.1–98.5F range then they can stay on that dose indefinitely.

- Side effects are more short term than long-term. Osteoporosis is unlikely. Can track blood C-telopeptide (C-terminal telopeptide of type 1 collagen (CTx)) as a marker for bone resorption, and blood P1NP (Procollagen type 1 N-terminal propeptide) as a marker for bone formation.
- Not addictive, won’t ruin thyroid gland
- Original protocol
Three most important instructions for patients

- Take the T3 on time.
- Write down pulse rate every morning.
- Pay attention to any disagreeable awareness of the heartbeat.
Most common side effects of T3 therapy

- Fluid retention
- Achiness
- Jitteriness
- Irritability
- Dull headache
- Increased awareness of heart beat
- Usually due to unsteady T3 levels from not taking the medicine on time
What to order

• If you want to follow the simplified treatment we just covered then it is usually convenient to order your patients an assortment or “starter pack” of capsules that they can use to go up on the doses and then wean down.
• The “10 x 6 Starter Pack” has 6 capsules of each of the 1st 10 strengths (7.5–75mcg)
• The “10 x 8 Starter Pack” has 8 capsules of each of the first 10 strengths
• The “12 x 6 Starter Pack” has 6 capsules of each of the first 12 strengths (up to 90 mcg)
• The “12 x 8 Starter Pack” has 8 capsules of each of the first 12 strengths
If you use a “10 x 6 Starter Pack” then your patient will be able to go up a strength every day and then wean down one strength every 2 days. The cycle will be over in 30 days.
If you use a “10 x 8 Starter Pack” then your patient will be able to go up a strength every day and then wean down one strength every 3 days. The cycle will take 40 days.
The advantage of weaning down more slowly:
• body has more time to come up and maintain the thyroid system

The disadvantage of weaning slowly:
• not always necessary
• the cycles take longer and are more expensive
12 x 6 and 12 x 8 Starter Packs are not usually used on the first cycle, but on the next, if the first cycle did not seem strong enough, because the 12 x 6 and 12 x 8 starter packs go up to 90 mcg doses instead of just 75 mcg.

90 mcg BID is a commonly used maximum dose.
With treatment, many patients enjoy complete resolution of their low temperature symptoms persisting years after the treatment is discontinued.

Without treatment, the symptoms can easily persist for decades and can even worsen during episodes of severe mental, emotional, or physical stress, causing untold loss of quality of life and productivity.
Though the goal is for the temperature and symptoms to remain improved even after the T3 has been discontinued, some people may benefit staying on some T3 on a continual basis. T3 is very well tolerated long-term.

A review of 28 studies showed no increase in osteoporosis in premenopausal women on suppressive doses of T3.

T3 therapy in patients currently taking T4

- What was the TSH before starting T4?
- Can wean T4 before or while cycling up on T3.
- Can wean off T4 over 1-3 days. 7 day 1/2-life

Singar Jagadeesan, MD
Neurologist; Cary, North Carolina

- **Thyroid formula and T3 for thyroid support in Parkinson’s disease.**
- Symptoms of Parkinson’s Disease (PD) and Hypothyroidism are very similar.
- Conventional treatment of PD is symptomatic and can cause side effects after years of use, therefore beneficial to delay use of Parkinson’s drugs when possible.
- “Using a thyroid formula and T3, I feel I can postpone using medicines for Parkinson’s by at least 6 months to one year, as well as improve the quality of life of patients who are using the PD medicines.”
T3 therapy in Lyme Disease

“90% of patients with Lyme are likely to benefit from adding T3 to the treatment protocol, whether or not TSH is high.”

“Less than 10% of Lyme patients have any adverse reaction to adding T3.”

“In 10% of Lyme patients in whom I’ve added T3, the T3 has been instrumental in improving response to therapy enough that they were able to discontinue antibiotics without return of Lyme symptoms.”
Conclusion

• TSH and body temperature are most predictive in helping patients feel well

• Low body temperature can result from either inadequate supply centrally, or inadequate conversion, expression peripherally

• High TSH indicates low thyroid hormone supply. Low body temperature and normal TSH indicates intracellular peripheral problem invisible to thyroid blood tests
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